

Attorney Docket No.: 01901071
Application Serial No.: 10/057,731

Amendments to the Claims:

The following listing of claims will replace all prior versions, and listings, of claims in the present application:

Listing of Claims:

Claim 1 (currently amended): An imager cell including a substrate ~~connected to a~~
~~voltage having a potential~~, the imager cell comprising:

a photoreceptor;

a sense node; and

a pinned transfer gate disposed between the photoreceptor and the sense node, the pinned transfer gate being ~~connected~~ pinned to the ~~voltage potential of the substrate~~ and further being configured to transfer charge between the photoreceptor and the sense node.

Claim 2 (original): An imager cell as defined in claim 1, wherein the pinned transfer gate comprises a p-doped pinned region in an n-doped transfer region.

Claim 3 (original): An imager cell as defined in claim 1, further comprising a photoreceptor readout gate disposed above the photoreceptor.

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Claim 4 (original): An imager cell as defined in claim 1, wherein the photoreceptor comprises a photogate.

Claim 5 (original): An imager cell as defined in claim 1, wherein the photoreceptor comprises a photodiode.

Claim 6 (original): An imager cell as defined in claim 1, further comprising a reset transistor disposed to reset the sense node.

Claim 7 (original): An imager cell as defined in claim 1, further comprising an output amplifier coupled to the sense node.

Claim 8 (original): An imager cell as defined in claim 7, wherein the output amplifier is a source follower amplifier.

Claim 9 (original): An imager cell as defined in claim 3, further comprising a readout clock connection coupled to the photoreceptor readout gate.

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Claim 10 (original): An imager cell as defined in claim 9, further comprising control circuitry coupled to the readout clock connection, the control circuitry supplying a photoreceptor readout clock.

Claim 11 (original): An imager cell as defined in claim 10, wherein the photoreceptor readout clock is characterized by a V+ level applied during an integration period, and a V- level applied during a transfer period.

Claim 12 (currently amended): An imager cell including a substrate ~~connected to a~~ voltage having a potential, the imager cell comprising:

a photoreceptor;

a sense node;

a pinned transfer gate disposed between the photoreceptor and the sense node, the pinned transfer gate being ~~connected~~ pinned to the ~~voltage potential of the substrate~~ and further being configured to transfer charge between the photoreceptor and the sense node; and

a photoreceptor readout gate disposed above the photoreceptor, the photoreceptor readout gate having material removed to form a photoreceptor readout gate light aperture above the photoreceptor, whereby the photoreceptor provides enhanced response to blue light.

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Claim 13 (original): An imager cell as defined in claim 12, further comprising a pinned aperture region under the photoreceptor readout gate light aperture.

Claim 14 (original): An imager cell as defined in claim 12, wherein the pinned transfer gate comprises a p-doped pinned region in an n-doped transfer region.

Claim 15 (original): An imager cell as defined in claim 12, wherein the photoreceptor comprises a photo gate.

Claim 16 (original): An imager cell as defined in claim 12, wherein the photoreceptor comprises a photodiode.

Claim 17 (original): An imager cell as defined in claim 12, further comprising a reset transistor disposed to reset the sense node.

Claim 18 (original): An imager cell as defined in claim 12, further comprising an output amplifier coupled to the sense node.

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Claim 19 (original): An imager cell as defined in claim 18, further comprising an anti-reflective coating disposed above the photoreceptor.

Claim 20 (original): An imager cell as defined in claim 12, further comprising a readout clock connection coupled to the photoreceptor readout gate.

Claim 21 (original): An imager cell as defined in claim 20, further comprising control circuitry coupled to the readout clock connection, the control circuitry supplying a photoreceptor readout clock.

Claim 22 (original): An imager cell as defined in claim 21, wherein the photoreceptor readout clock is characterized by a V+ level applied during an integration period, and a V- level applied during a transfer period.

Claim 23 (currently amended): An imager cell including a substrate ~~connected to a voltage having a potential~~, the imager cell comprising:

a photoreceptor;

a sense node;

a pinned transfer gate disposed between the photoreceptor and the sense node, the pinned transfer gate being ~~connected~~ pinned to the ~~voltage potential of the substrate~~

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further being configured to transfer charge between the photoreceptor and the sense node;
and

a photoreceptor readout gate disposed above the photoreceptor, the photoreceptor readout gate characterized by a photoreceptor readout gate thickness of less than 2000 Angstroms, whereby the photoreceptor provides enhanced response to blue light.

Claim 24 (original): An imager cell as defined in claim 23, wherein the photoreceptor readout gate thickness is less than 1000 Angstroms.

Claim 25 (original): An imager cell as defined in claim 23, wherein the photoreceptor readout gate thickness is less than 500 Angstroms.

Claim 26 (original): An imager cell as defined in claim 23, wherein the pinned transfer gate comprises a p-doped pinned region in an n-doped transfer region.

Claim 27 (original): An imager cell as defined in claim 23, wherein the photoreceptor comprises a photogate.

Claim 28 (original): An imager cell as defined in claim 23, wherein the photoreceptor comprises a photodiode.

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Claim 29 (original): An imager cell as defined in claim 23, further comprising a reset transistor disposed to reset the sense node.

Claim 30 (original): An imager cell as defined in claim 23, further comprising an output amplifier coupled to the sense node.

Claim 31 (original): An imager cell as defined in claim 28, wherein the output amplifier is a source follower amplifier.

Claim 32 (original): An imager cell as defined in claim 23, further comprising a readout clock connection coupled to the photoreceptor readout gate.

Claim 33 (original): An imager cell as defined in claim 32, further comprising control circuitry coupled to the readout clock connection, the control circuitry supplying a photoreceptor readout clock.

Claim 34 (original): An imager cell as defined in claim 33, wherein the photoreceptor readout clock is characterized by a V+ level applied during an integration period, and a V- level applied during a transfer period.

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Claim 35-57 (cancelled).

Claim 58 (currently amended): An imager cell including a substrate ~~connected to a voltage having a potential~~, the imager cell comprising:

means for detecting incident photons;

means for storing transferred charge for readout; and

a pinned transfer gate disposed between the means for detecting and the means for storing, the pinned transfer gate being ~~connected~~ pinned to the ~~voltage potential of the substrate~~ and further being configured to transfer charge between the means for detecting and the means for storing.

Claim 59 (original): An imager cell as defined in claim 58, wherein the pinned transfer gate comprises a p-doped pinned region in an n-doped transfer region.

Claim 60 (original): An imager cell as defined in claim 58, further comprising means for transferring charge from the means for detecting incident photons to the pinned transfer gate.

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Claim 61 (original): An imager cell as defined in claim 58, further comprising means for resetting the means for storing transferred charge.

Claim 62 (original): An imager cell as defined in claim 58, further comprising means for amplifying the transferred charge.

Claim 63 (original): An imager cell as defined in claim 60, further comprising means for clocking the means for transferring charge.

Claim 64 (original): An imager cell as defined in claim 63, wherein the means for clocking is characterized by a V+ level applied during an integration period, and a V- level applied during a readout transfer period.

Claim 65 (original): An imager cell as defined in claim 60, wherein the means for transferring charge comprises a photoreceptor readout gate characterized by a thickness of less than 2000 Angstroms.

Claim 66 (original): An imager cell as defined in claim 61, wherein the means for transferring charge comprises a photoreceptor readout gate characterized by a thickness of less than 1000 Angstroms.

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Claim 67 (original): An imager cell as defined in claim 61, wherein the means for transferring charge comprises a photoreceptor readout gate characterized by a thickness of less than 500 Angstroms.

Claim 68 (original): An imager cell as defined in claim 60, wherein the means for transferring charge comprises a photoreceptor readout gate having material removed to form a photoreceptor readout gate light aperture above the means for detecting incident photons.

Claim 69 (original): An imager cell as defined in claim 68, further comprising a pinned aperture region under the photoreceptor readout gate light aperture.

Claim 70 (currently amended): An imaging array including a substrate ~~connected to a voltage having a potential~~, the imaging array comprising:

an array of imager cells, each imager cell comprising a photoreceptor, a sense node, and a photoreceptor readout gate; and wherein at least one of the imager cells further comprises a pinned transfer gate disposed between the photoreceptor and the sense node, the pinned transfer gate being ~~connected~~ pinned to the ~~voltage potential of the~~

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substrate and further being configured to transfer charge between the photoreceptor and the sense node; and

control circuitry coupled to each photoreceptor readout gate for supplying a photoreceptor readout clock simultaneously to a set of photoreceptors in the array,

whereby accumulated charge in each photoreceptor is transferred to its sense node to provide a snapshot of an image acquired by the imaging array.

Claim 71 (currently amended): An imager cell including a substrate ~~connected to a voltage having a potential~~, the imager cell comprising:

a photoreceptor including a photoreceptor readout gate;

a sense node;

a pinned transfer gate disposed between the photoreceptor and the sense node, the pinned transfer gate being ~~connected~~ pinned to the ~~voltage potential of the substrate~~ and further being configured to transfer charge between the photoreceptor and the sense node; and

control circuitry coupled to the photoreceptor readout gate for applying a photoreceptor readout clock to the photoreceptor readout gate, the photoreceptor readout clock comprising an integration period characterized by an integration voltage selected from a plurality of predetermined integration voltages to setup a preselected charge capacity level in the photoreceptor.